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21 MAY 1962

MEMORANDUM FOR: Chief, Analysis Branch, DD/CR  
FROM : Chief, Publications Staff, ORR  
SUBJECT : Release of CIA/RR GM 62-5, The Struggle  
for Jordan Waters, May 1962, Confidential,  
to Foreign Governments

1. It is requested that the attached copies of subject report be forwarded as follows:

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2. All ORR responsibilities as defined in the DDI memorandum of 13 August 1952, "Procedures for Dissemination of Finished Intelligence to Foreign Governments," as applicable to this report, have been fulfilled.

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AUTH: HR 70-2  
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# GEOGRAPHIC INTELLIGENCE MEMORANDUM

CIA/RR GM 62-5  
May 1962

## *THE STRUGGLE FOR JORDAN WATERS*



DOCUMENT NO. 1  
NO CHANGE IN CLASS. ☐  
CLASS. CHANGED TO: TS S C  
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CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

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# THE STRUGGLE FOR JORDAN WATERS

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The first segment of the Israeli National Water Conduit, which will extend from the upper Jordan Valley to the Negev Desert in the south, is scheduled to receive water pumped from Lake Tiberias in late 1963. Progress on the construction of major features of the conduit appears to justify Israeli confidence that the schedule will be met. With the completion of this segment, Jordan water will, for the first time, be transported beyond the limits of the Jordan Valley. The Arab states are firm in their stand that to compromise permitting Israel to divert water from the Jordan Valley can be reached, and they have loudly but ineffectively protested retaliatory threats to deprive Israel of water by diverting major tributaries of the upper Jordan. South of Lake Tiberias on the Lower Jordan River, Israel and Jordan are proceeding with less friction in the development of their respective irrigation projects.

## I. The Master Plan of Israel

The core of Israel's plan for the development of water resources is the National Water Conduit -- a system of canals, tunnels, pumping stations, reservoirs, and pipelines to transport water overland from the Jordan Valley to southern Israel. This major artery will be linked to regional projects to draw available water can be diverted to those areas where the need is greatest. Near Rosh Ha'ayin in central Israel the National Water Conduit will connect with pipelines of the Yarkon-Megav Project, which will carry water as far south as BeerSheva in the northern Negev. Although water from the Jordan River is a critical element in the water plans of Israel and will eventually supply 30 percent of its water needs, the plans also rely heavily on the combined resources of ground water, sewerage, surface runoff, and water returned from irrigation.

The Beit Shean Project, designed to irrigate the Jordan and Beit Shean Valleys south of Lake Tiberias, is not connected with the National Water Conduit. Here, water drawn directly from Lake Tiberias is to replace that now being pumped from the Yarkon and Jordan Rivers. It is anticipated that the Beit Shean Project will benefit from plans being considered for the diversion to the lower Jordan of water from saline springs now emptying into Lake Tiberias and from the pumping of Yarkon waters into Lake Tiberias during the winter flood season.

Israel originally planned to tap the Jordan River near the Banat Jacob Bridge in the Demilitarized Zone north of Lake Tiberias. The water thus withdrawn was to be used to power a hydroelectric plant at Hahlgia on the northwestern shore of Lake Tiberias. In 1959, a clash with Syria occurred when Israel was at work on the section of the canal within the Demilitarized Zone. Work was stopped after the issue was raised in the Security Council of the United Nations, and the 1.5 miles of canal within the Demilitarized Zone have never been completed. The present plan is to draw water for the National Water Conduit from Lake Tiberias, rather than the upper Jordan, by means of the pumping station at Hahlgia. When, as Israel hopes, water becomes available from the upper Jordan River, the Hahlgia pumping station will be converted into the hydroelectric plant originally planned.

When Stage I of Israel's plan is completed in late 1963, water from Lake Tiberias will be delivered to the area of Rosh Ha'ayin east of Tel Aviv by means of 4 1/2 miles of 108-inch concrete pipe, 3 1/4 miles of 108-inch steel pipe, 23 miles of open canal, and 6 1/2 miles of large-diameter tunnel. By 1963, Israel plans to pump about 150 million cubic meters (cu m) of water per year from Lake Tiberias; according to an Israeli engineer the capacity of the pumps at Hahlgia is 200 million cu m per year. Stage II, tentatively planned for 1965, provides for a general increase in volume of water pumped and in storage and distribution facilities. By 1970, when all three stages of the plan have been completed, Israel expects to receive 100 million cu m of water from the Jordan River for the National Water Conduit, 100 million cu m for irrigation in the Hula area, and 50 million cu m for the Beit Shean Project, making a total of 200 million cu m per year withdrawal from the Jordan. Israeli estimates place the average annual flow of the Jordan within Israel at about 300 million cu m per year with extremes of 350 million cu m and 700 million cu m.

## II. Problems Arising in Israel

The ultimate success of Israeli water plans is closely associated with the climatic regime of the eastern Mediterranean -- an unreliable element at best. There can be little assurance that climatic and hydrological conditions upon which planning has been based will remain unchanged in the coming years. Heavy pumping and a series of abnormally dry years have already brought about an unanticipated lowering of the water table in the coastal plain east of Tel Aviv. In the face of this threatened water shortage, a temporary steel pipeline has been placed in service between a completed portion of the 108-inch pipeline and Rosh Ha'ayin Springs. Through this temporary pipeline, surplus water from the Be'er-Sheva-Hadot area midway between Tel Aviv and Haifa is carried south to supplement the flow of Rosh Ha'ayin Springs. It is estimated that even after several years of drought, Israeli water resources will provide only 120 million cu m of water per year whereas the sustained withdrawal during the late 1950's amounted to 180-200 million cu m per year.

The head of the Research Unit of the Mekorot Water Company, Ltd., which is the contractor for the water plan of Israel, has charged that a serious miscalculation has been made concerning the total volume of water that will be available from the Jordan River for the National Water Conduit, and others have asserted that withdrawal of large volumes of water will lower the level of Lake Tiberias significantly. Both charges have serious economic implications, and both have been firmly denied by the Director General of Water Planning for Israel. Nevertheless, projected water requirements for 1967 are 62 million cu m more than the anticipated supply from all sources. Although this shortage is not considered critical in view of the long-term nature of the estimate, it is indicative of the delicate balance of water in Israel.

## III. The Yarmouk River Project of Jordan

In June 1961 the Harza Engineering Company International presented the Jordanian East Ghor Canal Authority with plans for the Yarmouk-Jordan Valley Development Project, which places upon the dependence upon the waters of the Yarmouk River Jordan's major water resources. This proposal for irrigation in the Jordan Valley and for power generation in the Yarmouk Valley is based on five stages, proposed for completion in 1979. By this date 119,000 acres of the Jordan Valley are to be irrigated and a power-generating capacity of 42,700 kw is to be provided. Under terms of the 1953 Yarmouk River Treaty, Syria will receive a minimum of 10 percent of this energy.

Stages I and II of the project have been included in the Jordanian Five Year Program for Economic Development (1962-67). Stage I, which is being supported by the U.S. Aid Mission to Jordan, consists of a 3.33-foot tunnel and 4 1/2 miles of open canal on the East Ghor, extending south as far as Wadi Farja. This work was actually begun in 1958 and has now been completed to Kilometer 22.6, a distance of 18.1 miles. The remaining stages call for a 25-mile extension of the East Ghor Canal and the construction of a 28-mile canal on the West Ghor that will be linked with the East Ghor Canal near Wadi Farja. A diversion dam on the Yarmouk at Adama and a storage dam on the Yarmouk at Wadi Khalid are features of Stage II. At a later date the height of the Wadi Khalid Dam is to be increased, and a storage dam is to be constructed on the Yarmouk at Meqarin. Powerplants are to be installed below Wadi Khalid, at the Wadi Khalid Dam, and at the Meqarin Dam. When completed the storage dams at Wadi Khalid and Meqarin will provide 950 and 300 million cu m of water, respectively.

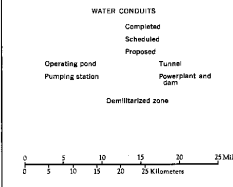
When the Yarmouk-Jordan Valley Development Project is implemented, it will require more water than is available from the average annual flow of the Yarmouk River, which amounts to 467 million cu m, and from the storage capacity provided by the Wadi Khalid and Meqarin dams. It is anticipated that much of this deficit can be made up through the construction of storage dams on wadis emptying into the Ghor in Jordanian-controlled territory. The original plan for the Yarmouk-Jordan Valley Project, prepared by Michael Bakay, C.E., and Harza Engineering Company in 1953, called for initial use of the waters of Lake Tiberias. Under the present plan, water from sources not completely under Jordanian control will be needed only in the final stages of development and then only if all land presently considered irrigable is used.

Israel has complained about the anticipated reduction in the flow of the Yarmouk River and increase in salinization of the Jordan River below Lake Tiberias that will result from diversion of Yarmouk River water by Jordan. The present flow of sweet water from the Yarmouk provides Israel to irrigate lands in the Jordan and Beit Shean Valleys, using water pumped directly from the Yarmouk and Jordan Rivers -- water that, under the Beit Shean Project, will have to be replaced by water from Lake Tiberias.

## IV. Arab Diversion Threats

Three tributaries flowing from Arab territory contribute 570 million cu m of water per year to the Jordan River in northern Israel. The Dan River, the largest tributary, has an average flow of 283 million cu m per year. Because the Dan rises on the Syrian-Israeli border, the use could not effectively be denied to Israel. The Hasbani River flowing from Lebanon and the Banias River rising in Syria each contribute 127 million cu m per year. Denial of Hasbani and Banias water could reduce the flow of the Jordan River north of Banat Jacob Bridge by about one-half. Some of the Arab Rices have held extended discussions over proposals to divert these headwaters and several plans have been put forth. To date, no real action has been made on the engineering problems involved or on sources of funds for these retaliatory ventures.

## JORDAN VALLEY WATERS



MEDITERRANEAN SEA

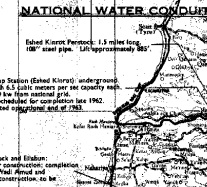
TEL AVIV (YAPO)

U.A.R. (EGYPT)

NEGEV DESERT

36162 442

## NATIONAL WATER CONDUIT



BEIT SHEAN PROJECT

THE YARMOUK-JORDAN VALLEY DEVELOPMENT PROJECT

DEAD SEA

ISRAEL

36162 442

One proposal would divert the Banias southward for a short distance to an area in which the water could be used for irrigation of Syrian territory. An extension of the plan would transport Banias water southward all the way to the Yarmouk River. Because the Banias flows through Syria for only about 5 miles, a reservoir would be required near the Israeli border. Before reaching the Yarmouk the water would have to be lifted several hundred meters and would then flow through a canal more than 34 miles in length.

Two plans have been advanced for the Hasbani River. One would divert Hasbani waters through a tunnel into the basin of the Litani River. The second would divert Hasbani water into a reservoir on the Banias River for transport to the south. Engineering data are lacking for both proposals.

Any scheme to divert the tributaries of the Jordan from their natural watershed would be costly and would provide scant economic return to Arab nations, even Jordan. Lebanon, already heavily committed in the Litani River Project, and Syria, whose hope for irrigation lies in a dam on the Euphrates River, will be hard pressed to find funds for the diversion of the Jordan River. In Arab deliberations over diversion of the waters of the Hasbani and Banias Rivers, however, political motives are likely to take precedence over economic considerations.

## V. Prospects

The Yarmouk is Jordan's only major hope for irrigation water and power generation. Implementation of the Yarmouk-Jordan Valley Development Project will increase the industrial potential of Jordan, nearly double the area of its irrigated agricultural land, and provide land for more than 10,000 farm families. For Israel the River Jordan is the last major untapped water resource. Based upon present water consumption patterns, completion of Stage I of Israel's plan in 1963 will provide for a population increase of approximately 300,000 people. If the full project is completed in 1969, an increase of 500,000 could be accommodated, including 400,000 industrial workers. This is far short of the projected population increase of 8 million discussed optimistically in Israel and fearfully in Arab states. In view of its high dependence upon the water of Lake Tiberias, Israel is likely to exercise prudence to maintain a high water level and a low degree of fluctuity in the lake. As a working reality, many features of the present plans for development of the water resources of the Jordan Valley could be accomplished through the use of the water of the Jordan River by Israel and the use of the water of the Yarmouk River by Jordan. Nevertheless the chronic Arab protest against the use of Jordan River water outside the Jordan Valley remains unaltered.

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## JORDAN VALLEY WATERS

## WATER CONDUITS

- Completed  
Scheduled  
Proposed
- Operating pond  
Pumping station
- Tunnel  
Powerplant and dam

DOCUMENT NO. 2  
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REVIEWER: ☐

Demilitarized zone

0 5 10 15 20 25 Miles  
0 5 10 15 20 25 Kilometers

MEDITERRANEAN SEA

## NATIONAL WATER CONDUIT

Eshed Kinrot Penstock: 1.5 miles long  
108" steel pipe. Lift approximately 805'

Tablaha Pump Station (Eshed Kinrot): underground.  
3 pumps with 6.5 cubic meters per sec capacity each.  
Takes 70,000 lws from national grid.  
Installation scheduled for completion late 1962.  
Plant estimated operational end of 1963.

Canal between penstock and Eilabun:  
operating pond under construction; completion  
in 1962. Siphons at Wadi Amud and  
Wadi Talmoun under construction, to be  
complete in 1962.

Eilabun (Talmoun) Operating Pond and Pumping Plant:  
both under construction. To be completed in 1963.  
Pumps will lift 334'.

Eilabun Tunnel: excavated and 92% lined.  
To be completed in 1962. 2,739' long.  
Canal to be continued through

Beit Netofa Canal: construction started.  
To be lined in 1963. 12 miles of open canal.

Beit Netofa Reservoir: 10% complete.  
To be completed in 1963.

Canal to be completed in 1963.

El Kandula Tunnel: excavation 35% complete.  
Lining planned for 1963. To be 5,240' long.

108" pipeline from El Kandula to  
Menashe Tunnels: no construction to date.  
To be completed in 1963. Will be last of  
108" line completed.

Menashe Tunnels: 45% lined. Northern tunnel  
20,920' long. Southern tunnel 1,312' long;  
being lined. May 1961.

108" pipeline - Menashe Tunnels to Rosh Ha'ayin  
36 miles. 57% completed.  
From a point east of Hadera to  
2.5 miles north of Rosh Ha'ayin  
section is complete (approx.  
20 miles).

Temporary 24" steel pipeline: 2.5 miles long.  
In operation between end of 108"  
pipeline and Rosh Ha'ayin.

Rosh Ha'ayin Springs and Pumping Station

70" Yarkon-Negev West Pipeline:  
Completed in 1961.

Proposed extension 108" pipeline.

Planned termination of the 108" pipeline  
of the National Water Conduit.

66" pipeline: extension of Yarkon-Negev  
East Pipeline completed in 1955.

66" Pipelines (proposed).

Reservoirs (proposed).

U.A.R.

(EGYPT)

NEGEV DESERT

ISRAEL

JERUSALEM

TEL AVIV

TEL HA'AYIN

TEL SHEVA

TEL AVIV

TEL AVIV

TEL AVIV

TEL AVIV

## JORDAN

DEAD  
SEA

MID EAST

MID EAST

MID EAST

MID EAST

MID EAST

MID EAST

MID EAST

MID EAST

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